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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,310	03/03/2004	Teemu Pohjola	0404US-Oplayo	4352

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EXAMINER	
WERNER, DAVID N	

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2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/792,310	POHJOLA ET AL.	
	Examiner	Art Unit	
	David N. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☒ Claim(s) 6 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 March 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is the First Action on the Merits for US Patent Application 10/792310. Currently, claims 1-20 are pending.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the term "logic" in claim 12 is not defined in the specification. As such, it is unclear if the encoder is comprised of a hardcoded or hardware implementation, as supported by the term "compression unit" elsewhere in the claim, a software implementation, as supported by paragraph [0073] of the specification, or some combination thereof.

Claim Objections

3. Claim 6 objected to because of the following informality: the word "Langrangian" should be "Lagrangian". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 provides for "using" a time-related term as part of an extended cost function, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Similarly, claim 6 provides for "using" a Lagrangian cost function.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1 and 6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1 and 6 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd. App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-5 and 7-20 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,953,506 A (Kalra et al.). Kalra et al. teaches a system for transmitting scalable digital data. Regarding compressing a block in a plurality of compression modes, in Kalra et al., a DCT compression macroblock is encoded as a base Σ0 stream and additive Σ1-Σ7 streams, with different levels of compression detail (column 6, lines 11-65). For the highest distortion and fastest image decoding, only the base stream is transmitted. To decrease distortion, at the cost of slowing image decoding, more additive streams are transmitted with the base stream. Regarding selecting a time-related term for decoding a block, the selected compression mode depends on a CPU constraint, dependent on the time it takes for a CPU to decode a video frame in a given compression mode (column 17, lines 25-54). Regarding forming an extended cost function with a time-related term, the CPU constraint, along with a network bandwidth constraint, determine which compression modes and frame rates are available for the user. Figure 15B2B shows the compression modes and frame rates available based on a bandwidth constraint alone, and figure 15B2C shows the available compression modes and frame rates based on a bandwidth constraint and a CPU constraint (column 17, lines 10-54). Regarding calculating a cost, the numbers in figures 15B2A-15B2D

show a normalized CPU constraint number for decoding a frame. Regarding choosing the compression mode for a minimum cost, the claimed "cost" is the tradeoff between decoding time and image quality, referred to throughout Kalra et al. as "spatial resolution". In Kalra et al., a user chooses a preferred compression mode. In this case, the user prefers maximum image quality. However, due to bandwidth and CPU limitations, a video of maximum quality for a given image may only be transmitted at 5 fps (column 17, line 55–column 18, line 9). As shown in figure 15B2C, other users may select other preferred compression modes. For example, one user may wish to view a video at the maximum possible frame rate. In this case, as shown in figure 15B2C, a frame rate of 24 fps may be achieved with the lowest image quality. Another user may select a video with moderate quality at 15 fps. Figures 16A2 and 16A3 show a series of curves showing various user preferences for video quality, as compared with bandwidth and processing power (column 16, lines 1-28).

Regarding claim 2, as shown in figure 16A1, the step of determining the CPU constraint is determined once, before an adaptive video stream is transmitted (column 15, lines 45-50), although the overall client profile will be update according to bandwidth, which may change (column 15, lines 33-44). Regarding claim 3, the CPU constraint may be determined from recognizing a known CPU type in a client computer (column 17, line 41). Regarding claim 4, the CPU constraint is adjusted according to the processing resources needed to decode associated audio with the video stream. Then, only a certain amount of processing power is available for video decoding (column 17, lines 34-36). Regarding claim 5, a user may choose a video profile

according to desired image quality or percentage of CPU resources dedicated to video or audio (column 15, line 66–column 16, line 17). Regarding claim 7, as shown in figures 15B2A-15B2B, a low-quality, 5 fps mode may be chosen to reduce decoding time. Regarding claim 8, as mentioned above, the CPU constraint is dependent on the processing capabilities of a client terminal that decodes the video (column 17, lines 39-41). Regarding claim 9, the CPU constraint is determined by having the client terminal test sample streams (column 15, lines 51-65). Regarding claim 10, a set of curves for known CPU configurations, determining available video options, is shown in figure 16A3 (column 16, lines 7-17). Regarding claim 11, the time to decode the test streams is measured, and the average decoding time is used to determine the CPU constraint (column 15, line 56).

Regarding claims 12 and 17, figures 13 and 14 of Kalra et al. show server 400 containing an adaptive stream server connected over a network to client 500 (column 15, lines 11-32). Regarding the "compression unit", the adaptive stream server includes a plurality of standard MPEG encoders, as shown in figure 9A, and a series of scaling encoders, which output the various scaled video streams (column 8, lines 33-65). Regarding calculating the cost for a compressed block, the server receives a user profile from the client and transmits the appropriate adaptive streams according to a user preference (column 16, lines 18-24). As mentioned previously, the user profile indicating a preferred video mode corresponds with the cost function. Regarding selecting a compression mode, the adaptive stream server uses a profile received from a user to determine which stream to transmit (column 16, lines 38-42). Regarding claim

13, as mentioned previously, a video profile may be based on a preferred image quality, or CPU allocation (column 15, line 66–column 16, line 17). Regarding claim 14, again, the percentage of the CPU allocated to video decoding, as opposed to audio decoding, is used as a weighting factor in determining the CPU constraint measure (column 17, lines 34-36). Regarding claim 15, as stated above, the CPU constraint directly depends on time to decode an image (column 17, lines 25-54). Regarding claims 16 and 19, as shown previously, each of the curves in figure 16A3 corresponds with a capacity group, and the CPU type determines the range of encoding modes, depending on a user's preference for high-quality audio or video (column 16, lines 7-17). Regarding claim 18, figure 1 shows a transcoder that converts video in a standard format to a set of adaptive streams, which are shown as stored on disks (column 3, line 66–column 4, line 5). Regarding claim 20, transcoding takes place before transmission (column 8, lines 51-53), so it is inherent that the transcoded video is stored on the server before being transmitted to a receiving terminal.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalra et al. in view of US Patent 5,768,436 A (Keesman). Claim 6 of the present invention

states that the extended cost function incorporates a Lagrangian cost function. However, Kalra et al. does not mention this step.

Keesman teaches a method for encoding video. First, video is encoded as typical according to an MPEG encoder by performing the Discrete Cosine Transform on blocks of 8 by 8 pixels (column 3, lines 4-11). However, in Keesman, the quantization is performed according to a Lagrangian cost function so that the Lagrangian cost is minimized with respect to a distortion term and a bitrate term (column 1, lines 33-53). The improved coefficients are then thresholded, again to minimize a Lagrangian cost function (column 6, lines 20-48).

Kalra et al. discloses the claimed invention except for incorporating a Lagrangian cost function into video compression. Keesman teaches that it was known to adjust DCT coefficients of a compressed video and perform thresholding my minimizing a Lagrangian cost. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a Lagrangian cost calculation in a video compression system, as taught by Keesman, since Keesman states in column 1, line 59 that such a modification would reduce distortion for a given bitrate.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,014,693 A (Ito et al.) discloses a system for transmitting a variable number of frames in a video over a network according to a network mode measurement. US Patent 6,665,872 B1 (Krishnamurthy et al.) teaches a

system for dynamically allocating a bandwidth to multiple video streams according to differing latency requirements for the videos. US Patent 6,798,838 B1 (Ngo) teaches a wireless device that processes layered data. US Patent Application Publication 2005/0138671 A1 (Love et al.) teaches an adaptive wireless transmission system in which quality is changed if an uplink communication indicates that current broadcast quality is insufficient. "Rate-Distortion Optimal Fast Thresholding with Complete JPEG/MPEG Decoder Compatibility" (Ramchandran et al.) teaches minimizing distortion in a JPEG or MPEG encoder by finding a minimum Lagrangian cost. "Rate Control in Video Coding by Adaptive Mode Selection" (Ryu et al.) teaches choosing a compression mode based on a variable decision curve.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571) 272-9662. The examiner can normally be reached on Monday-Friday from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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DNW

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TC 2600